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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/629,444	07/29/2003	Paul S. Danielson	SP03-091	5737

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EXAMINER

YU, MELANIE J

ART UNIT	PAPER NUMBER
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1641

DATE MAILED: 05/25/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/629,444

Applicant(s)

DANIELSON ET AL.

Examiner

Melanie Yu

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 07 April 2005.
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-3,5 and 7-25 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 1-3,5 and 7-25 is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☒ The drawing(s) filed on 29 July 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____

DETAILED ACTION

1. Applicant's amendment filed 7 April 2005 has been entered. Claims 4 and 6 have been canceled. Claims 1, 2, 8, 10, 11, 13, 18 and 21 are currently amended. Claims 1-3, 5 and 7-25 are currently pending.

Withdrawn Rejections

2. Prior rejection of claims 8-12 and 21-23 under 35 USC 102(e) have been withdrawn in view of Applicant's amendment. Prior rejections of claims 1-7 and 13-23 under 35 USC 112, second paragraph have been withdrawn in view of Applicant's amendment.

Claim Rejections - 35 USC § 112

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 24 and 25 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The new claims 24 and 25 provide pores having pore sizes greater than 0.5 μm . It is noted that the instant specification discloses pores being about 5 μm , and pores having an average size between about 0.5 to 1 μm , but the specification does not disclose the range of greater than 0.5 μm .

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4. Claims 8-12 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claims 8 and 10 recite a composition in weight percent comprising at least one of the following either individually or in combination: Co_3O_4 , NiO , and R_xO_y . It is still unclear which components are required for the composition. The claim is interpreted as requiring both Co_3O_4 and NiO at the wt. % recited or R_xO_y at the wt. % recited.

Claim Rejections - 35 USC § 102

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

5. Claims 1-3, 5, 7, 13-20 and 23 are rejected under 35 U.S.C. 102(e) as being anticipated by Pantano et al. (US 2003/0054176).

Regarding claims 1-3, 5, 18 and 19 Pantano et al. teach a porous substrate comprising: a nonporous support [0002]; and an inorganic porous region on a surface of the support [0025, 0026, 0053], the inorganic porous region having a surface capable of immobilizing probe molecules [0007], the inorganic porous region having a tint and exhibiting a reduced level of auto-fluorescence of at least about 50% relative to a comparable non-tinted porous substrate surface [0008], which encompasses the recited reduced auto-fluorescence values of at least about 15%, at least about 20-25%, and at least about 50%. The reduced relative auto-fluorescence level in RFU (less than 70 self fluorescent units) is at least an order of magnitude over the non-tinted porous substrate surface (relative self fluorescent units are relative fluorescent units; [0021]), and the reduction is over a wavelength range from about 470 and 700 nm (fluorescent dyes are FluorX, Cy3 and Cy5 which have an emission window between 470 nm and 700 nm,

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and is the same window over which the auto-fluorescence is reduced; Fig. 2 – excitation and emission data for fluorescent dyes; Fig. 3 – auto-fluorescence reduction over range; [0041, 0049]), which encompasses the recited ranges of 400 to about 720 or about 420 nm to about 700 nm.

With respect to claims 7 and 20, Pantano et al. teach the tinted porous region having a colorant component including a transition metal ion (Zinc; [0051]).

With respect to claim 13, Pantano et al. teach a tinted region having an average auto-fluorescence background for Cy3 and Cy5 channels [0041] of up to about 50% RFU of said untinted porous substrate [0008]. Claim 13 recites a GAPS-coating process, which fails to provide further product limitations on the product of claim 1, and is therefore not considered part of the product of claim 13.

Regarding claims 14-17 and 23, Pantano et al. teach a number of biological DNA probes attached at defined locations on or within the porous layer [0062], wherein the defined locations assume a microarray format of 10,000 probe droplets/cm² [0035], which encompasses the recited ranges of microspots of at least 1 and at least 10 microspots per cm².

Claim Rejections - 35 USC § 103

6. Claims 8, 9, 21 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pantano et al. (US 2003/0054176) in view of Mizuno et al. (US 2002/0042068).

Pantano et al. teach a tinted porous region of borosilicate glass consisting essentially of the weight percentages of the following components: SiO₂: 65-75 %, Al₂O₃: 0-3%, B₂O₃: 0-5%, K₂O: 5-15%, MgO: 0-6%, CaO: 0-10%, SrO: 0%, BaO: 0.1-5%, Sb₂O₃: 0-2% [0053], all of which weight percentages fall within the recite ranges of claims 10 and 21. Pantano et al. fail to

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teach the porous region having a colorant component incorporated in a composition in weight percent where x and y are > 0 .

Mizuno et al. teach borosilicate glass [0087] comprising Fe_2O_3 in a weight percent of 0.11% (table 1, column C), which is encompassed by the recited range of 0-10 wt. %, in order to provide to provide further reduced light absorption.

Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to include in the substrate of Pantano et al., Fe_2O_3 in a weight percent of 0.11% as taught by Mizuno et al., in order an inexpensive glass made of fewer raw materials.

7. Claims 10, 24 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pantano et al. (US 2003/0054176) in view of Tanner et al. (US 2003/0003474).

Pantano et al., as applied to claim 1 and 10, teach a porous region comprising a composition consisting essentially of the components listed above, but fail to teach SrO being present in the composition.

Tanner et al. teach a glass composition comprising 0.58 wt % SrO (Table 1, [0057]), which is encompassed by the recited range of 0.5-1.75 wt %, in order to create a porous layer made from borosilicate frit to reduce background fluorescence.

Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to include in the composition for the porous layer on the substrate of Pantano et al., 0.58 wt % SrO as taught by Tanner et al., in order to provide a porous, inorganic substrate surface to enhance the retention of nucleic moieties and provide increased surface area for immobilizing DNA probe molecules, which increase the density of DNA binding sites per unit cross-sectional area of substrate.

Regarding claims 24 and 25, Tanner et al. teach a pore size of not less than 0.1 μm ([0009]), which encompasses the recited range of a pore size greater than 0.5 μm .

8. Claims 11 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pantano et al. (US 2003/0054176) in view Mizuno et al. (US 2002/0042068) further in view of Young et al. (US 6,391,809).

Pantano et al. in view of Mizuno et al., as applied to claims 1 and 8, teach a borosilicate glass composition, but fail to teach the coefficient of thermal expansion.

Young et al. teach borosilicate glass having a coefficient of thermal expansion of 30-40 $\times 10^{-7}/^{\circ}\text{C}$, in particular a borosilicate lamp glass being 38 $\times 10^{-7}/^{\circ}\text{C}$ (col. 1, lines 51-53), in order to provide a fusion-type seal with a low softening temperature while also maintaining a low to medium coefficient of thermal expansion.

Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to include in the borosilicate glass composition as taught by Pantano et al. in view of Mizuno et al., a coefficient of thermal expansion of 38 $\times 10^{-7}/^{\circ}\text{C}$ as taught by Young et al., in order to match the coefficients of thermal expansion between a borosilicate non-porous glass substrate and the porous inorganic layer.

Response to Arguments

9. Applicant's arguments filed 7 April 2005 regarding rejection of claim 1 under 35 USC 102(e) have been fully considered but they are not persuasive. Applicant argues that Pantano fails to disclose or suggest the porous region having a "tint" to reduce the level of auto-fluorescence. Claim 1 recites a porous region having a tint *and* exhibiting a reduced level of fluorescence. The substrate of Pantano exhibits a reduced level of fluorescence (par. 0021) and

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does not completely eliminate self-fluorescence, which indicates a tint is present (low fluorescence indicates fluorescence and tint must be present, par. 0021).

10. Applicant argues that in order to maintain low levels of auto-fluorescence, one should exclude transition metal ions, a limitation recited in instant claims 7-10, 21 and 22. However, Pantano teach a transition metal ion, zinc, present in the porous region, and transition metal ions must therefore not necessarily be excluded (par. 0052). Applicant also argues that zinc does not serve to color or tint glass, and therefore cannot be considered a colorant or tint. At page 14, the instant specification discloses a colorant being any transition metal ions providing a tint, where Fe, V and Cu are specific examples. However, zinc is a transition metal ion and is not excluded from being a colorant in the instant specification. Furthermore, since zinc is not transparent it will provide tint, and is therefore considered a colorant component. The rejection of claims 8-10 has been withdrawn in light of Applicant's amendment.

11. Applicant's arguments with respect to the rejection(s) of claim(s) 8-12, 21 and 22 under 35 USC 102(e) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Applicant's amendment requiring at least one of the recited compositions for a tinted inorganic porous region comprising a colorant component incorporated in a recited weight percent.

12. In response to applicant's arguments against the references of Pantano and Young, and Pantano and Tanner, individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642

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F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

Conclusion

No claims are allowed.

13. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Melanie Yu whose telephone number is (571) 272-2933. The examiner can normally be reached on M-F 8:30-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Long Le can be reached on (571) 272-0823. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Melanie Yu
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Art Unit 1641



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05/24/05